

MOTOR DEVELOPMENT:
THE ROLE OF THE ORIENTATION AND
MOBILITY SPECIALIST

by Laurel Watson
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MOTOR DEVELOPMENT:

THE ROLE OF THE ORIENTATION AND MOBILITY SPECIALIST

-by-

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Orientation and mobility specialists have long been challenged to meet the individual needs of the visually impaired child. Orientation and mobility has been relatively successful in tailoring travel training sequences to include experiences meaningful to the individual child. Orientation and mobility specialists are, however, also requested to alleviate general motor deficiencies, such as posture and gait difficulties, balance, and laterality problems. These problems are often most evident during the actual orientation and mobility instruction. A normally intelligent visually impaired child can compensate for his motoric deficiencies, and somehow learn to travel independently, but this is often the child whose movements are awkward, who has only nominal control of the long cane or other tools, and has a difficult time comprehending and applying orientation techniques. Often the causes are rooted in developmental movement deficiencies and the child has never fully developed an internal organization of his body and the way it can move. Orientation and

mobility specialists hesitate evaluating and remediating movement problems because they lack training in child development and the processes of developmental movement. However, if the mobility specialist fully explores the title, orientation and mobility specialist, he must realize his responsibility to teach not only the orientation of "body awareness" and space, but the full orientation of self, and not only the mobility of movement through space, but movement of the body and the quality of that movement.

Orientation and mobility instruction has included the teaching of body image and "awareness" for years. Recently orientation and mobility specialists have been publishing ideas and curricula that go beyond the simple naming of body parts, which begins to fulfill the requisites for a total concept of self. The curricula now available includes identification, relationships of parts, functions, clothing relationships, and some movement. One of the most complete volumes, The Development of Body and Sensory Awareness for the Visually Impaired, is available through the Illinois Office of Education Instructional Materials Center, Springfield, Illinois.

Orientation and mobility specialists also need to understand the developmental processes that are needed to acquire an internal organization of meaningful information

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about self. Until the child can organize internal space, such as laterality, external space will always be a mystery affecting the child's movement through space.¹

Movement is reliant upon the sequential development of motor skills.² Orientation and mobility curriculum requires a high level of internal organization as well as highly developed motor skills, for all students regardless of age, physical conditions, or performance level. Again, the curriculum is tailored, but in the end, the child is required to perform motor tasks, such as walking with or without a cane, while processing a variety of environmental information in order to maintain orientation. By teaching high level skills without the prerequisite sequential developmental motor skills, the child must learn by rote or fail.

As orientation and mobility specialists, the authors have been frustrated with the students who after years of training have made little progress. In reviewing the history of the failing students, we have discovered that we have tried nearly all the recognized techniques. Because these techniques have failed, we have decided that

¹Byant J. Cratty, Developmental Sequences of Perceptual-Motor Tasks, p.23.

²Clara M. Chaney & Newell C. Kephart, Motoric Aids to Perceptual Training, p. 3,4.

they are inappropriate when matched with the actual skills of these children. This discovery emphasized the importance of child development with its implications of developmental lag in the visually impaired child. We felt that the orientation and mobility specialist must learn to evaluate the child's internal organization and motor skills development level prior to evaluation for traditional orientation and mobility instruction.

Materials that deal with all facets of motor skills, including perceptual-motor, gross motor, movement exploration, developmental movement, and co-active movement are helpful in developing an understanding of developmental movement. Most of these disciplines deal with normal children or learning disabled children, but the ramifications for the visually impaired child are overwhelming. The materials when used properly by the orientation and mobility specialist can provide programming that is appropriate for the visually impaired child. The program can be varied to work with visually impaired children from pre-school through secondary grades. The children who participate can range in vision problems from partially sighted to totally blind with or without concomitant handicapping conditions. The following

chart describes twelve of the children who have participated in the program. All children have been enrolled in public school resource or itinerant programs.

PROFILES OF TWELVE PARTICIPANTS

| Student # and Sex | Age at entry | Yrs. in Prog. | Visual Impairment | Concomitant Handicapping Condition | I.Q. Range | Mobility Problems Observed | Motor Problems Remediated |
|-------------------|--------------|---------------|---------------------------------|---|----------------------|--|---|
| 1. M | 3 | 3 | Unable to test, very low vision | Language delay Rubella-hearing impaired | Below normal limits | Fell easily-poor balance. Constant movement Rigid movement | Balance improved-could walk in grass and play-ground. More relaxed movements. |
| 2. M | 5 | 2 | LP | Behavior Disorder Language Delay EMH | Below normal limits | Wide Based Gait 2 Feet on stair Constant movement Rigid movement | Gait unchanged Alternates feet on stairs. Able to relax when assisted. |
| 3. M | 5 | 1 | OD NLP OS 20/40 | NONE | Within normal limits | Trips on stairs Much extraneous movement. | Balance improved Differentiates movements out of relaxation |
| 4. F | 6 | 2 | NLP | NONE | Within normal limits | 2 Feet on stair No concept of body sides.No concept of turning. | Alternates feet on stairs. Understands body planes and sides, not generalized to turning yet. |
| 5. M | 6 | 1 | NLP | Language Delay | Within normal limits | Constant movement Rigid movements Shuffling Gait | Mannerisms, movements significantly decreased Relaxes when reminded Gait somewhat improved through balance. |
| 6. F | 8 | 2 | NLP | NONE | Above normal limits | 2 Feet on stair 2 Hands on rail Fearful traveller | Alternates feet on stair. Differentiates sides-uses one hand on rail. Relaxed traveller Could concentrate on route. |

PROFILES OF TWELVE PARTICIPANTS

| Student # and Sex | Age at entry | Yrs. in Prog. | Visual Impairment | Concomitant Handicapping Condition | I.Q. Range | Mobility Problems Observed | Motor Problems Remediated |
|----------------------|--------------------|---------------------|----------------------|--|----------------------------|--|---|
| 7. M | 10 | 2 | OU 20/200 | NONE | Within normal limits | Could not use left/right labels 2 Feet on stair | Learned body sides, middle, planes-uses labels. Alternates feet on stair. |
| 8. M | 10 | 1 | OS LP OD 20/20 | NONE | Above normal limits | Collided with obstacles. Reluctant to move. | Motor planning skills increased-stops move- ment before colliding. Relaxed movements- more confident. |
| 9. M | 12 | 1 | LP | NONE | Below normal limits | Unable to travel on uneven surfaces tense, rigid move- ments. Rocking Gait. | Balanced improved- travels on a variety of surfaces. Relaxes when reminded. Small Gait Change. |
| 10. F | 12 | 2 | NLP | Behavior disordered | Below normal limits | Rigid movements. Could not use left/right labels. | Movement more relaxed. Identifies side, planes, middle; uses labels. |
| 11. F | 13 | 3 | NLP | NONE | Above normal limits | Inability to center arm. Ina- bility to remem- ber turns made. Extraneous movements. | Cane position improved More awareness of kin- esthetic information mannerisms, movement decreased. |
| 12. M | 16 | 3 | OD NLP OS 10/600 | NONE | Within normal limits | Extraneous movements Rigid movements Inability to remem- ber turns made. | Some decreased move- ments observed.Able to relax when reminded.In- creased awareness of Kinesthetic information. |

The motor development program can include physical and occupational therapists as part of the motor team. The therapists often serve as an additional instructor or participate in a consultative role.

Occupational therapists provide inservices and resources on relaxation techniques, reflex integration testing and gross and fine motor assessment. Physical and occupational therapists work as part of the motor team when dealing with children with severe physical limitations.

The orientation and mobility specialists provide inservices and resources on visual impairment and techniques for teaching body image, differentiation, balance and concepts. The sharing of various techniques add strength to all the existing programs.

Due to space consideration, the following three specific examples have been selected as having been successful in the use of new techniques to evaluate and remediate old problems. The activities that follow are by no means complete, but rather an introduction to stimulate thought and further exploration into the reference material on the reader's part. Spatial concept development is appropriately taught to children in conjunction with motor programming. The movement problems we deal with here are sequentially: differentiation and relaxation, laterality, and balance.

I. DIFFERENTIATION

One phase of motor development is the ability to differentiate individual body movements.³

³Clara M. Chaney and Nancy R. Miles, Remediating Learning Problems: A Developmental Curriculum, p. 63-74.

Differentiation encompasses knowledge of body parts, all specific individual movements, and the ability to move body parts in cooperation, without unnecessary movement in other body parts. For example, a child should be able to bend and rotate his thumb, as well as touch each finger to the thumb, and also make a fist. Each exercise above should be accomplished without face clenching, sympathetic movement of opposite hand, or unnecessary tension in neck, shoulders, and arms. One example of lack of differentiation that the mobility instructor sees often is in the student who has difficulty learning adequate wrist motion with long cane technique. When the specialist needs to repeat and repeat wrist movement instructions, the problem likely has its roots in the child's misunderstanding of the roles his various muscles have and how they move independently and interdependently. Children will perhaps learn by rote, but the learning is not only tedious, but often does not become automatic, therefore prohibiting the simultaneous use of essential orientation skills:⁴

The child who consistently moves his cane arm as a unit instead of developing the wrist motion

⁴ Gesell, op. cit., p. 65

regardless of repeated instruction may not be able to differentiate his wrist from his arm.⁵ The child who rotates his wrist when traveling with the cane also may not have achieved differentiation. If differentiation of wrist and arm is lacking, it is highly probable that the child is lacking differentiation of movements throughout his body. These undifferentiated body parts need to be identified and remediated.

The remediation for wrist/arm differentiation might be as follows:

A. RELAXATION: Before any movement exercises can be beneficial, a child must learn how to relax his body.⁶ Visually impaired children often exhibit extreme tension in movement. For example, arms are often drawn up against the body, shoulders are tensely held in a semi-shrug. The child looks uncomfortable and his posture is tense and defensive. In the past we have tried to remediate these problems with posture exercises and reminders rather than teaching the child the difference between tension and relaxation.

Relaxation can be achieved in several ways, but there must be total body relaxation before one can proceed with movement activities. Total body relaxation has taken

⁵Chaney and Miles, op. cit., p. 18.

⁶Wineva Grzynkowicz & Martha Kephart; Editors, Learning Disabilities, Last Lectures of Newell C. Kephart, p. 81.

place when the child passively allows the instructor to manipulate any part of the body with no muscular resistance or assistance. There are a variety of relaxation methods.

Prerequisites for relaxation include a quiet environment free from stress, such as an exercise mat in a quiet, warm room. The child's clothing should be loose and comfortable, with shoes and socks removed. At this point, the child is positioned comfortably with the instructor's body, bolsters and/or pillows to give the child support conducive to relaxation. Unless the child trusts the teacher and his environment, relaxation is not possible, so when implementing the relaxation procedures, the child needs firm, calm commands.

Relaxation techniques include deep muscle massage and manipulation, stroking, rotation of limbs and joints and tension-release exercises.⁷ A recent Clara Chaney workshop,⁸ has further elaborated on relaxation techniques. She advocates the use of large bolsters placed under the child's stomach and chest with the child's head and arms dropped. This position is one of the most effective for relaxation for all age groups.

A particular technique may not be suitable for all children. It is necessary to explore the various techniques available and adapt them for individual students.

⁷Grzynkowicz and Kephart, op. cit., p. 81-112.

⁸Brough Learning Center, Danville, Il. May, 1977.

B. After a child understands and can attain relaxation, differentiation exercises can begin. Before specific remediation (i.e. cane technique) can be achieved, a program for total body differentiation must be developed. The following references for these procedures are helpful: Chaney, Kephart; pp. 93-111; Chaney, Miles; pp. 11-33; Robinson; pp. 13-34. (See Bibliography)

For an example review the following program for specific remediation for differentiation of the wrist/arm/shoulder as it pertains to wrist movement in cane technique. Differentiation between hand and arm can be achieved through understanding movements of the wrist. A sequence of exercises for differentiation is as follows:

- 1) Seat or lie the child down comfortably.
- 2) Place the child in a comfortable position and inhibit movement of the arm.
- 3) Grasp child's hand and move it smoothly through the entire range of motion, telling the child what the movement is, i.e. rotation of wrist and forearm, in language understandable to the child.
- 4) Ask the child to assist in a specific movement such as rotation with your guidance. Watch for sympathetic movements in the hand or overflow movement throughout the body. By making the child aware of individual movements versus global movements, the instructor insures that a child is learning to differentiate specific movement.
- 5) Ask the child to perform movement independently. Movement (such as rotation) should be smooth without jerks

B. continued-----

5) or hesitation. He may be able to go only halfway through the movement at first, stop and then continue movement, resting at the beginning, middle, and the end of the movement.

6) To enhance the child's kinesthetic awareness of movement, the instructor can resist movement with light pressure, or a light, one pound, wrist weight. Again, total movement must be smooth.

7) Repeat sequence with other specific movements, i.e. bending wrist up and down, bending wrist sideways.

Similar sequences can be followed for differentiation of arm movement in relation to elbow and shoulder.⁹ Work up the arm from wrist and forearm to the elbows, exploring such movements as bending and straightening and then to the shoulder with such movements as rotation, shrug, forward and backward stretch, and then movement of the arm as a total unit from the shoulder. Remember with each new movement, instruction focuses on that movement in isolation to other body parts and no other parts of the body should be in movement or tension. It may be necessary to put weights on body parts that move sympathetically in order to emphasize to the student the overflow movement. A one pound weight often helps to increase the student's awareness of the separateness of his various body movements.

⁹ Janet I. Robinson, Vanguard School Program: Body Awareness, p. 13-18.

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After each individual part has been successfully differentiated, explore movement combinations with the arm components, i.e. rotate wrist while lifting arm at shoulder, or bend wrist and elbow without shoulder movement.

At this point, the child will be very conscious of his body movements. In order for the actual movements to become automatic, the instructor can provide activities to shift the focus of attention to outward directed relevant movement, such as opening a drawer with movements of the arm instead of the entire body. The transition to cane technique is obvious. First, the child has become oriented to efficient movement of individual body parts. Secondly, the child's performance of simple tasks in his environment is facilitated by differentiation of movement. At last, the difficult task of utilizing very specific motor skills in the learning of cane technique becomes more naturally achieved, because time has been taken to assure good differentiation of movement.

II. LATERALITY

Another general phase of motor development is the development of laterality. Rote memorization of right and left does not constitute laterality. True laterality is an internal organization of a midline and two halves, upper/lower, sides, front, and back.¹⁰ A child must have an

¹⁰Grzynkowicz, Kephart, op. cit., p. 187.

internal understanding of body symmetry prior to the assignment of left-right labels. As all orientation and mobility specialists know, a child that has difficulty remembering his right from his left will have difficulty organizing space. Most instructors have been frustrated by the failures of external reminders, such as tape or rings, that once removed take with them the child's "concept" of right and left. To establish an internal left and right, the child must be given organized, sequential motoric instruction dealing with his body symmetry.¹¹ Included in this sequential understanding is differentiation, sides and planes of body, unilaterality (what is on one side of the body), bilaterality (what body parts are pairs), and finally the labeling of left and right. As always, relaxation and differentiation come first. The concept of body sides and planes is frequently taught, but one must be careful not to label them too early in the sequence of internalizing laterality. When exploring two sides of the body, verbal and tactual clues can be given rather than left-right labels. "Show me your arm. Show me your other arm."

A few sequential exercises that we have found helpful follow:

A. Log-rolling on carpeted surface or other surface that offers tactual input. Roll from front to back and

¹¹Grzynkowicz, Kephart, op. cit., p. 187.

stop, etc. Roll from side to side and stop. Provide a permanent orienting device, such as the instructor's voice remaining in stationary position. "What are you facing, the floor or the ceiling? Are you facing toward or away from me? Roll to another side of your body. Roll so that your ear is on the floor. Where is your other ear?"

B. After general awareness of body planes, it is important to organize internal laterality from extremities to midline:

- 1) Have the child discover the number of limbs through body exploration.

- 2) Have the child discover the location of limbs in relation to sides of the body in such activities as the following questions: "Show me your arm. Where is your other arm? Are they in the same place? Where does your arm start? Where does your arm end? Do both arms start in the same place?"

- 3) Next, differentiate the midline in relation to body halves: touch the child's shoulder and ask him to wave hand closest to where you have touched; touch various parts of child's body and head, front, back and sides, asking the child to wave hand, shake foot, etc. nearest the touch.

- 4) Next are activities for crossing midline in relation to laterality such as: the child holds arms straight out to side parallel to floor and brings arms into center with elbows straight until hands meet, brings hands in to touch chest bending elbows. Stretch arms out again, and use both hands clasped to touch one ear, one shoulder, one leg, etc. When crossing midline, opposite

side becomes taut; ask the child which side is stretching, which side is closer to the named body part, which side is farther.

5) Activities for differentiating halves of body are next.

a) Ask the child to lie on the floor, putting half of his body on the mat and half on the floor. Watch for the child's method of solving the problem, i.e. upper/lower halves of the body placed on the mat, right/left halves of the body placed on the mat, and whether the child places front or back to the mat. Ask why he divided his body that way. Ask if he can think of any other way to divide his body.

b) Ask the child to show you how to divide his body so that one of each of all paired body parts will be on the mat, i.e. one arm, one leg.

6) Now the child should be ready to begin work on labels "right" and "left". Begin working with dominant side only at first, if known. Work through differentiation always referring to the right side, for example, and the "other" side until the child really understands the label "right". Repeat activities from above using one arm only along with its label. The label "left" should become quickly understood when it is introduced in later instruction.

Once laterality is established, the task of projecting body planes into space and spatial organization will become easier, because the child will not have to consciously consider his own body planes before interpreting space. Many laterality problems are interrelated

with balance problems. Some of the exercises for working with balance that will be explored later can enhance the understanding of laterality.

III. BALANCE

The third general phase of motor development in this discussion is balance. An example of a child who may have balance problems is the child who clings to the handrail of a staircase, walking up and down the stairs with two feet on each step. He may need to hold his balance rigidly between his feet. The child with poor balance is threatened when taking a step up or down from an even based stance on one plane. His balance shifts from his two feet, to his grasp on the handrail, back to his two feet together again on the next step.

The older child may have compensated for his balance and developed a good stair technique, but he may also have further developmental motor problems that need evaluation, and remediation. Again, balance, like all motor skills, must be taught in a developmental sequence. The following balance activities give only a brief outline of the suggested sequences. Please refer to the bibliography for more ideas and activities. In all balance activities, begin working with the child on the floor and in contact with the instructor. This is the most non-threatening approach.

A. CHECK FOR PROTECTIVE REFLEXES:¹² Seat the child on the floor with legs extended, and push sideways gently to see if the child's arm on that side extends to stop the fall. With the child on his knees, push the child forward to see if arms extend forward to stop the fall. These are protective reflexes and if they are not developed, do not proceed any further without consulting medical records for neurological disorders. Consultations with an occupational or physical therapist could also be beneficial. If reflex is intact, proceed.

B. CHECK FOR THE RIGHTING REFLEX:¹³ The righting reflex is the reflex that enables the child to return to an upright position when the body has moved away from an upright position. It is the foundation for balance. Put the child in sitting position on the floor between the instructor's legs and rock the child to one side slowly. When the instructor feels the child jerk reflexively to protect himself, hold the child's arms to prevent falling and ask the child to sit up straight instead of falling over. Can the child sit up? If the righting reflex is absent, the problem could be neurological or simply developmental and therefore remediable. If neurological, again consulting with an occupational or physical therapist before proceeding is indicated. A child whose righting problem is developmental usually relies strongly

¹²Mary R. Fiorentino, Reflex Testing Methods for Evaluating Central Nervous System Development.

¹³Ibid.

on the protective reflex or holds with rigid tension to the midline, and cannot be easily rocked by another person from the upright position. Children who rock themselves can have either of these problems. Activities that aid the development of the righting reflex follow.

1) Repeat procedures for the reflexive check, but bring the child back up when his protective reflex occurs, then let the child try this alone. One may have to offer support until the child is comfortable stopping before his balance is threatened and then returning to an upright position. After the child can return to upright, try resisting his movement lightly, and increase force as the child succeeds at the task. Do this for all directions of movement, always bending from the waist in the seated position, i.e. front, back, and sides. When the child is developmentally ready to move off the floor, try these above sequences in an upright kneeling position, standing on a low platform and sitting on a chair. Encourage bending from the waist.

2) These can be done simultaneously with "1". The child lies on the floor on his back, and instructor slides the child's upper body to the side on the floor so that the upper body and lower body form an angle to each other. Ask the child to straighten out his body. The child may need instructor assistance for the first few times. Ask where he feels his muscles pulling. Try lying the child on his side and bending the upper body slightly backward, and let him straighten himself; then bend forward and straighten. The child may experience

some difficulty as it is difficult to maintain balance when lying on his side. Point out kinesthetic input of muscles and joints to the child, i.e. "Where is it pulling? Does it pull when you are straight? Which side will pull if I bend you this way?"

3) Once the child has demonstrated the ability to consistently right himself, rather than depend on the more primitive protective reflexes, try some fun activities. Rocker boards that move in two directions are fun. Have the child sit on the rocker board with feet on the floor initially, then with feet on the board. Practice rocking front to back, side to side, arms folded, arms stretched above the head, hands on shoulders, reach for objects above, in front, and to sides. Try standing on the rocker board later. If the child is good at this, a complex rocking board that rocks in all directions might be employed. Encourage trunk movement rather than head movement. As another activity, ask the child to keep the board from rocking at all while maintaining balance.

Another game involves the concepts of push and pull. Child and instructor kneel upright, facing each other, and the child places hands on instructor's shoulders. The instructor knee-crawls slowly backward, telling the child to bend at the waist and not to crawl forward as the child is pulled forward. When the child feels like he has got to either fall or come back up, he must pull the instructor back to the starting position. The instructor may or may not offer slight to moderate resistance.

4) Now that the child can right himself efficiently, he is beginning to develop awareness of his trunk movements and adjustments necessary to maintain balance. Balance is often broken into two categories, static and dynamic. Static balance is the ability to maintain a stationary position without falling, and requires good trunk control. Dynamic balance, on the other hand, is the child's ability to maintain balance while moving through space, i.e. up a flight of stairs. The authors have found that good static balance is not necessarily a prerequisite for good dynamic balance, however, activities in both areas are beneficial.

Some static balance activities include upright kneeling, balance on hands and knees on four, three, and two points, balance on side, etc. The game "King of the Mountain" played on a mat, requires the child to maintain a standing position in one spot while being pushed. Something to be considered is the child's strength and flexibility. A child who lacks strength and flexibility has difficulty performing these tasks. Consult the physical education teacher for activities and exercises to remediate these problems.

5) Dynamic balance activities include knee-walking forward, backward, and sideways; crawling with one hand off floor; the commercial game "Twister"; maneuvering through obstacle courses that include stepping over chairs, stepping in and out of boxes, walking on a variety of surfaces, such as mat, sand, gravel, trampoline, grass, broken concrete; stepping up and down onto various sized

blocks and boosting self over with one foot only on block.

As stated earlier, a child having difficulty on stairs may be experiencing balance deficiencies. By working through a balance development sequence with the child, he becomes more aware of how his body feels in movement, and learns to adjust his balance while moving.

In this way, the child is given more confidence in movement and is ready for the complex task of climbing stairs. He may still show some hesitation, but if he knows he can balance himself, the fears will dissipate faster than if he feels threatened at all times.

Our observation is that the children who were given the opportunity to progress through developmental motor sequences were more confident travelers because they had a total concept of themselves and their movements. These children seem more equipped to process concepts of space. We are aware that more research is needed.

The authors believe that it is the Mobility Specialists' role to continue exploring motor development to enhance the quality of orientation and mobility curricula and to broaden the teacher training experiences to deal with children with developmental lags in motoric areas. In light of child development and motor development, the authors invite orientation and mobility specialists in the field as well as challenge training universities to explore the full ramifications and responsibilities of being Orientation and Mobility Specialists.

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